SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

PRELIMINARY DRAFT STAFF REPORT FOR PROPOSED AMENDED RULE 1175 – CONTROL OF EMISSIONS FROM THE MANUFACTURE OF POLYMERIC CELLULAR (FOAM) PRODUCTS

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Deputy Executive Officer
Planning, Rule Development, and Area Sources
Elaine Chang, DrPH

Assistant Deputy Executive Officer
Planning, Rule Development, and Area Sources
Laki Tisopulos, Ph.D., P.E.

Planning and Rules Manager
VOC Rule Development
Larry Bowen, P.E.

Written By: William Milner - Air Quality Specialist

Contributors: Michael Cecconi, P.E. – Senior Air Quality Engineer
Hubert Wilson – Air Quality Analysis and Compliance Supervisor

Reviewed By: Edward M. Muehlbacher, P.E. - Program Supervisor
Jeri Voge – Senior Deputy District Counsel

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EXECUTIVE OFFICER

BARRY R. WALLERSTEIN, D.Env.

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EXECUTIVE SUMMARY

Proposed Amended Rule 1175 has been developed to provide expandable polystyrene molding operations with an alternative compliance option that is superior in terms of emission reduction benefits and more cost-effective compared to the compliance options currently available in the rule.

Pentane is a blowing agent impregnated into tiny beads of polystyrene, such that when the beads are exposed to steam they will expand at relatively low temperature and pressure to 10 to 40 times their original volume, or more. These expanded beads become the basis for molding operations in which beads are fused together to form architectural construction products, packaging materials, or specialty products.

Facilities engaging in expanded polystyrene (EPS) molding operations are required to demonstrate that the volatile organic compound (VOC) emissions (of which pentane is one), from delivery of the beads, through all manufacturing steps, as well as fugitive molded product storage emissions are less than 2.4 pounds per 100 pounds of raw beads (Rule 1175(c)(2)). Alternatively, if a facility cannot demonstrate this limit on a continuous basis, it must control its manufacturing operations and its diffuse residual VOC product storage emissions, through the first 48-hours of its lifetime, by containing, capturing and destroying the VOCs by 90 and 95 percent, respectively (Rule 1175(c)(4)). The difficulty of controlling fugitive residual VOC within the molded product is that the size of storage areas are large and the release of VOC is very small by comparison, as demonstrated by recent emissions testing.

The proposed amendment has been developed in response to requests from industry for additional compliance flexibility, and focuses on recent advances in the low-pentane bead and molding technologies. It provides block molding manufacturers, that commit to conduct a significant fraction of their molding operations with low-pentane bead, while curtailing the use of high-pentane bead, with a more flexible and cost-effective compliance alternative. Under this alternative, rather than controlling manufacturing and storage emissions by 85.5 percent as required under the current rule, a block manufacturer will be allowed to over control manufacturing emissions, in lieu of controlling the less cost-effective storage emissions. The proposed overall control efficiency of the manufacturing emissions is 93 percent. This alternative will provide compliance flexibility, and pollution prevention, while resulting in equivalent or superior environmental benefits, as compared to current rule requirements.

BACKGROUND

Rule 1175, as adopted in 1989 and revised in 1990, controls VOC, chlorofluorocarbon (CFC), and methylene chloride emissions from expanded polystyrene foam molders, direct injection polystyrene foam extrusion (XPS), polyurethane, isocyanurate and phenolic foam operations. All steps of the manufacturing operation and final product storage for the first 48 hours for EPS foam molding operations after product manufacture are subject to the requirements of this rule. For all other polymeric cellular manufacturing operations, the requirements are the same except that ventilation of the fugitive storage emissions is for a 24 hour period, rather than for 48.

The focus of Rule 1175 during it original development was to reduce VOC emissions through add-on control technology. During rule development, an alternative was included that would allow facilities to show compliance on a raw material throughput basis such that the emissions from both manufacturing and post manufacturing operations be less than 2.4 pounds of VOC per 100 pounds of raw material processed, assuming all blowing agent is released from the product. This alternative compliance option was initiated through a company that manufactures thin-walled molded EPS drinking cups and bowls and vents its bead expansion and prepuff aging process VOC emissions to a boiler for thermal destruction. Their manufacturing operation uses EPS beads with a relatively constant pentane content, constant product density, negative air pressure on its bead expansion and prepuff aging rooms, and elevated temperature within its aging room, while venting both aging room and expansion operations to a thermal control device. To provide additional compliance flexibility, and in response to industry requests, this alternative compliance option was also extended to all other sectors of the EPS molding industry, including the thick-walled shape and block molders. It was understood, however, that the utility of this alternative compliance for shape and block molders would be limited because these operations produce products having higher residual pentane content in the manufactured product than molded EPS cups, due to lower pentane diffusion rates through thicker wall structures, and product is manufactured at variable density, depending on its final application.

One block molding firm proposes to demonstrate equivalent emission collection and control of the manufacturing and storage emissions by over-controlling the manufacturing emissions, in lieu of controlling their less cost-effective EPS block storage areas, and they formally requested the AQMD to amend the rule to provide an equivalent compliance alternative. Staff has worked with the manufacturer to ensure the testing protocols and procedures are adequate and meet AQMD standards. A rule amendment is proposed to allow demonstration of equivalent collection and control of manufacturing and storage VOC emissions.

PROCESS DESCRIPTION AND CONTROLS

EPS Molding Operations

Vendors of EPS bead supply 1,000 pound or more corrugated cartons or bulk fabric meshed bags (called gaylords) of pentane impregnated polystyrene beads at various pentane contents (typically 3.6 – 6.2 percent by weight). Pentane is the only available blowing agent for expandable polystyrene beads. Pentane initially releases when the containers are opened due to VOC saturated headspace within the gaylords. The bulk beads are usually top-loaded into feed hoppers that supply raw EPS beads to a pre-expander at a fixed rate. Steam, supplied from a boiler liberates pentane from the beads and expands the less than 1 millimeter diameter beads to pre-established densities depending on initial pentane content, residence time, and temperature/pressure profiles applied during pre-expansion. Pre-expansion pentane gas is either directly thermally destructed or it can be routed to a large aging room for subsequent thermal destruction. The expanded bead is called “prepuff”. Fresh prepuff has a lower pentane content than unexpanded resin and will have higher moisture content because of steam condensation occurring during pre-expansion. As a result, the prepuff is either pneumatically conveyed to a fluidized bed dryer and then to the aging room, or it may be sent to the aging room directly.

Prepuff storage or aging accomplishes three primary tasks[1]:

- Permits surface pentane to disperse, making the pre-puff less heat-sensitive during molding; and
- Allows moisture to evaporate, producing a dryer prepuff; and
- Provides time for air penetration into the prepuff cells, displacing the vacuum created during pre-expansion, and further stabilizes the prepuff.

There are two primary types of prepuff aging vessels: woven cloth or mesh bags and metal silos. Aging times vary but are typically between 3 and 24 hours. Higher initial pentane contents of the raw bead generally increase the aging time. The prepuff is now ready for pneumatic transport to the block molder or shape molder where steam infuses into the process and forms the prepuff into the desired shape or block under a vacuum. It should be noted that at the time Rule 1175 was originally adopted, low vacuum or compression molding was the norm. This has now been replaced by batch high vacuum molders.

Block and shape molders in the AQMD vent aging room pentane laden air to a boiler, direct thermal oxidizer, catalytic oxidizer or a regenerative thermal oxidizer (RTO) for thermal destruction of the VOC. Since pentane is approximately 2.5 times heavier than air, it is extracted via vents and ductwork at or near floor level throughout the aging room. Other points of the process such as pre-expansion of the bead as well as molding operations are also vented to the thermal destruction device.

After molding, EPS products are now ready to be stacked and stored to further age the product prior to shipment, or hot wire cutting into insulation board and architectural trim. Rejected materials are re-ground and either reintroduced with fresh prepuff, or can be molded into scrap blocks for resale. Regrinding liberates all residual pentane in the product.

EPS process emissions occur as fugitive emissions in several stages of manufacturing and post manufacturing. The first occurs from opening of the gaylord and charging them to the feed hoppers, followed by VOC emissions releases at the point of pre-expansion, fluidized bed drying, prepuff aging, molding, unloading and storage of the molded product, and cutting and regrinding of any recycled material.

The rate by which pentane is released is significantly higher during the manufacturing phase of the process, compared to product storage phase. As a result, most of the facility-wide pentane emissions occur during manufacturing phase of the process. While the rate of emissions slows down considerably during the post manufacturing phase, emissions that occur during product storage can be significant, especially for large throughput facilities. Because manufacturing emissions are more concentrated, their control is much more cost-effective, compared to the control of fugitive storage emissions. During rule development, post-manufacturing emissions occurring during the first 48 hours of storage were determined to be significant and that could be cost-effectively controlled.

[1] Expandable Polystyrene Storage and Handling Safety Guide, 2002 Nova Chemicals Corporation

The emission reduction benefit of controlling fugitive pentane emissions that occur during the first 48 hours of product storage, was factored into the derivation of the 2.4 pounds of VOC per 100 pounds of raw bead alternative requirement, and incorporated into Rule 1175(c)(2). The figure was derived assuming the process started with a raw bead containing 6 percent pentane, which is reduced to 1.8 percent at the end of 48 hour storage and overall emissions are controlled by 85.5 percent. The 2.4 lbs VOC per 100 lbs of raw material requirement of Rule 1175 (c)(2) was requested by industry and was included in Rule 1175 as an alternative to controlling both manufacturing and product storage emissions at a minimum of 90 percent capture and 95 percent destruction efficiencies.

One EPS block molder has proposed a second alternative to the capture and control of both manufacturing and storage emissions by over-controlling manufacturing emissions and not controlling storage emissions. The company has successfully completed its testing program to make this demonstration, and has received conditional approval of its source test at this time. A summary of that testing program, as well as an example of theoretical compliance is included as Appendix A.

STAFF PROPOSAL

Staff proposes to amend Rule 1175 as follows:

- Add an alternative that allows EPS block manufacturers to demonstrate equivalence to the collection and control requirement by demonstrating over-control of the manufacturing emissions by at least 93 percent, and using at least 60 percent low-pentane bead, with the remainder being mid-pentane bead on an annual basis.

- Reinforce that storage emission capture efficiency is defined to be at least 90 percent by weight by adding to the definition of an approved control system this minimum efficiency in subparagraph (b)(1)(B).

- Add a definition for low-pentane bead to mean those beads that contain less than 4.0 percent by weight pentane as a blowing agent (as an upper limit), prior to shipment, as certified by an accompanying bead lot manufacturer's Certificate of Analysis.

- Add a definition for mid-pentane bead to mean those beads that contain less than 5.2 percent by weight pentane as a blowing agent (as an upper limit), prior to shipment, as certified by an accompanying bead lot manufacturer's Certificate of Analysis.

- Add a definition for Certificate of Analysis as a written document supplied by the manufacturer of bead lots that lists a range of pentane contents, expressed as a percentage by weight, prior to shipment.

- Modify the definition of EXEMPT COMPOUNDS by referring to Rule 102 – Definition of Terms

- Add a definition for STORAGE EMISSIONS, for rule clarity to mean emissions of VOC, CFC, or methylene chloride occurring for a maximum of 48 hours after the polymeric cellular product is manufactured.

- Modify the definition of VOLATILE ORGANIC COMPOUND (VOC) by referring to Rule 102 – Definition of Terms

- Revise references to rule nomenclature to indicate the correct reference to paragraphs, and subparagraphs.

- Clarify emissions control requirement subparagraph (c)(4)(b) to refer back to the definition of an approved emissions control system in subparagraphs (b)(1)A), (b)(1)(B) or (b)(1)(C), depending on applicability.

- Change the title of subdivision (f) to Methods of Analysis and add an introductory paragraph referring and to the appropriate federal, state and local agencies. Add the EPA approved capture efficiency test procedures presented in the U.S. EPA technical guidance document "Guidelines for Determining Capture Efficiency, January 9, 1995" in subparagraph (f)((3)(A). Notwithstanding the test methods specified by the Guidelines, any other method approved by the U.S. EPA, CARB, and the SCAQMD Executive Officer may be substituted.

- Add Method 25.3 (Determination of Low Concentration of Non-Methane Non-Ethane Organic Compound Emissions from Clean Fueled Combustion Sources) so that a control device seeing low input or output VOC ppms can be tested accordingly.

- Add other language amendments for clarity and consistency.

EMISSIONS INVENTORY AND POTENTIAL EMISSION REDUCTIONS

Table 1 below represents the VOC emissions from all known EPS and XPS foam fabricators in the basin, as taken from the emissions annual emissions reporting years of 2000 through 2004. In addition, although VOC emissions were reported for blown polyurethane foam, staff has not included them because the chemical reaction is swift and should not produce any VOC emissions, except for molecules only of unreacted isocyanate, the catalyst used for forming rigid and flexible urethane foam products.

It should be noted that some of the EPS foam block manufacturers listed have since ceased molding operations in the AQMD.

Table 1

Foam Fabricators 2000 - 2004 Reported Annual Emissions (Tons per Year)

COMPANY NAME	FOAM TYPE PRODUCED	2000	2001	2002	2003	2004
DART CONTAINER	EPS CUPS/BOWLS AND XPS THERMOFORMED SHEET PRODUCTS	135.122	181.66	195.408	196.975	205.426
PREMIER INDUSTRIES	EPS BLOCK	81.189	102.566	113.404	110.078	113.41
PACTIV	XPS THERMOFORMED SHEET PRODUCTS	41.999	39.216	40.539	36.874	47.323
FREE FLOW PACKAGING	XPS PACKAGING MATERIALS	42.713	38.668	31.972	29.076	24.533
LIFE-LIKE PRODUCTS	EPS SHAPES	25.134	19.62	30.754	55.342	54.665
STOROPACK/FOAM PAC	EPS PACKAGING MATERIALS	28.752	9.906	9.830	11.607	11.826
STOROPACK INC.	EPS PACKAGING MATERIALS	20.650	5.200	4.563	4.031	4.785
FALCON FOAM	EPS BLOCK	49.586	19.045	20.707	23.801	21.873
ADVANCE FOAM	EPS BLOCK	7.989	8.727	14.062	15.473	10.387
FOAM FABRICATORS	EPS SHAPES	14.878	10.845	10.127	26.100	27.601
TOPPER PLASTICS	EPS SHAPES	5.084	6.145	1.287	1.001	0.936
ELM/DOLCO PACKAGING	XPS THERMOFORMED SHEET PRODUCTS	2.914	3.635	2.546	0.001	0.001
TOTAL (TPY)		**456.010**	**445.233**	**475.199**	**510.359**	**522.766**
TOTAL (TPD)		**1.25**	**1.22**	**1.30**	**1.40**	**1.43**

The proposed amendment should result in no change in emissions since they only offer the opportunity for demonstrating equivalent emission collection and control or clarify the existing rule.

COST, COST EFFECTIVENSS, AND INCREMENTAL COST EFFECTIVENESS

The proposed amendments should not result in additional costs to industry. Since there is no additional cost and no change in emissions, cost effectiveness is not applicable. Health and Safety Code Section 40920.6 requires an incremental cost effectiveness analysis when there is more than one control option to achieve the emission reduction objective of the proposed amendments, relative to ozone formation, CO, SOx, NOx, emissions and their precursors. Since the proposed amendment offers only a voluntary option for demonstrating equivalent control of pentane emissions occurring during the manufacturing of EPS block product, and does not have an emission reduction objective, the Health and Safety Code Section 40920.6 analysis is not required.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

Pursuant to State California Environmental Quality Act (CEQA) Guidelines and the AQMD's Certified Regulatory Program (Rule 110), the appropriate CEQA documentation will be prepared to analyze any potential adverse environmental impacts associated with PAR 1175. Upon completion, the CEQA document will be released for public review and comment, and will be available at AQMD Headquarters, by calling the AQMD Public Information Center at (909) 396-3600, or by accessing AQMD's CEQA website at: http://www.aqmd.gov/ceqa/aqmd.html, upon release.

SOCIOECONOMIC IMPACT ANALYSIS

The proposed amendments to Rule 1175 do not significantly affect air quality or emission limitations and therefore a socioeconomic impact analysis pursuant to California Health and Safety Code Section 40440.8 is not required.

LEGISLATIVE AUTHORITY

The California Legislature created the AQMD in 1977 (The Lewis-Presley Air Quality Management Act, Health and Safety Code Section 40400 et seq.) as the agency responsible for developing and enforcing air pollution control rules and regulations in the Basin. By statute, the AQMD is required to adopt an Air Quality Management Plan (AQMP) demonstrating compliance with all state and federal ambient air quality standards for the Basin [California Health and Safety Code Section 40460(a)]. Furthermore, the AQMD must adopt rules and regulations that carry out the AQMP [California Health and Safety Code Section 40440(a)].

DRAFT FINDINGS

Before adopting, amending, or repealing a rule, the California Health and Safety Code Section 40727 requires the AQMD to adopt written findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity - The AQMD Governing Board has determined that a need exists to amend Rule 1175 – Control of Emissions from the Manufacture of Polymeric Cellular (Foam) Products, to allow for other equivalent control options through increased overall efficiency of pentane emissions generated through the manufacturing of block expanded polystyrene.

Authority - The AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from the California Health and Safety Code Sections 39002, 39650, 40000, 40001, 40440, 40702, 41508, and 41700, et seq.

Clarity - The AQMD Governing Board has determined that the proposed amendment to Rule 1175 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency - The AQMD Governing Board has determined that Proposed Amended Rule 1175 is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, federal or state regulations.

Non-Duplication Rule 1175 does not impose the same requirements as any existing state or federal regulations, and the proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD.

Reference - In adopting this regulation, the AQMD Governing Board references the following statutes which the AQMD hereby implements, interprets or makes specific: California Health and Safety Code Sections 40440(a) (rules to carry out the Air Quality Management Plan), and 40440(c) (cost-effectiveness), 41508, 41700 (nuisance), and Federal Clean Air Act Section 172(c)(1) (RACT).

AQMP AND LEGAL MANDATES

The California Health and Safety Code requires the AQMD to adopt an Air Quality Management Plan (AQMP) to meet state and federal ambient air quality standards with the South Coast Air Basin. In addition, California Health and Safety Code requires the AQMD to adopt rules and regulations that carry out the objectives of the AQMP. Although the goal of Control Measure PRC-07 of the 2003 AQMP is to further control VOC emissions from industrial processes and could apply to Rule 1175, the proposed amendments do not result in additional emission reductions; however the amendments are consistent with AQMP objectives.

This proposal does not impose a new emission limit or standard, make an existing emission limit or standard more stringent or impose new or more stringent monitoring, reporting or recordkeeping requirements and therefore is not subject to the comparative analysis provisions of California Health and Safety Code Section 40727.2.

DRAFT CONCLUSIONS AND RECOMENDATIONS

Demonstration of equivalent emissions to those required by Rule 1175(c)(4) for EPS block manufacturing is possible through over-control of the manufacturing emissions, without controlling residual pentane losses of storage emissions through the first 48 hours of block storage. Staff recommends a rule amendment to include an option to controlling both manufacturing and storage emissions to the extent specified in Rule 1175(c)(4)(B)(i) and (ii) provided the manufacturing emissions are controlled by demonstrating an overall efficiency of at least 93 percent and low pentane beads are used at least 60 percent of the time on an annual basis, with the remainder being mid-pentane.

APPENDIX A: EPS BLOCK TESTING PROGRAM AND EXAMPLE COMPLIANCE DEMONSTRATION

An EPS block maker conducted independent tests to quantify residual pentane emissions from molded polystyrene block storage (phase 1) as well as quantifying its manufacturing operation emissions (phase 2). Both types of tests underwent substantial protocol scrutiny by the AQMD and U.S. EPA, and were approved by the AQMD. The following summarizes the testing program.

In phase 1, a variable temperature sealed SHED chamber test directly measured pentane emissions over 48 hours of storage. Several billets of molded polystyrene foam of different product densities and raw bead pentane content were manufactured and placed in the SHED within one hour of molding. Small volumes of air were extracted at 10 minute intervals and analyzed for total hydrocarbons by a flame ionization detector in accordance with EPA Method 25A and recorded. Previous to block transport, samples of raw bead type and molded block polystyrene material were taken and placed in sealed vials for independent analysis of pentane content according to Method 306-91 – Analysis of Pentanes in Expandable Styrene Polymers. The testing occurred over a nine month period from November 2005, though July 2006 due to the scheduling necessary to accommodate 13 individual 48-hour runs in total.

Phase 2 testing was conducted on August 17 and 18, 2006, to determine the capture and control efficiencies of the EPS manufacturing operation. Twelve hours prior to the test, all bags in the bag farm were empty, and a predetermined quantity of beads were expanded and aged for 12 hours so that molding could begin for the 12 hour test the following day. Once testing began, the manufacturing line began simultaneously expanding, aging, and molding. As aged bead was molded out, fresh prepuff was being filled to aging bags to replace that which was being molded. At the end of the test, the same quantity of bead existed in the bag farm, as started with, and subject to the same set of aging conditions, thus completing the cycle.

The following lists the methods used and approved by the AQMD during the manufacturing emissions test.

- Sampling and analysis of VOCs as pentane was conducted using EPA Method 25A.
- Flow measurements by SCAQMD Methods 1.1-2.1.
- SCAQMD Method 25.1 and 25.3 were conducted simultaneously at the inlet and exhaust.
- Method 2.1 measurements used during periods of instrument calibrations. Continuous flow measurements taken using a reference point and electronic temperature and magnahelic readouts logged to a data system.
- A pentane standard was used on each hydrocarbon analyzer to determine an instrument-specific response factor. VOC inlet and outlet emissions were reported referenced to this standard.
- SCAQMD Method 306-91 (Analysis of Pentanes in Expandable Styrene Polymers) was used to determine pentane contained in the raw material and in the freshly

molded billets. The total amount of pentane in the molded billet and the amount of pentane in the total raw bead used during the cycle were used to calculate the amount of pentane available for capture.

- The RTO combustion chamber temperature was continuously recorded, using the circular chart recorder installed on the unit.
- Differential pressure across the bagfarm containment, as measured by a permanently installed very-low pressure transmitter, was logged hourly.
- Data is integrated over the length of the test to present final collection and capture efficiencies.

To date these tests have been conducted and the results are complete and conditionally approved by AQMD Source Testing personnel. Knowing both the fugitive storage emissions from the SHED test and the overall abatement system efficiency, a comparison of the current Rule 1175 requirement to control both manufacturing and fugitive storage emissions through the first 48 hours after molding by capturing 90 percent of fugitive storage emissions and destroying them by 95 percent (85.5 percent overall) can be made with the tested manufacturing abatement efficiency.

Table 2 is an example of an equivalence demonstration in theory. The example demonstration is tabulated as pounds of VOC emitted per pound of product because there is no approved method for determining water moisture content in either the billet or the bead. Without knowing water content, the results cannot be expressed in terms of pounds of VOC per pound of raw bead. Table A-1 is a mathematical demonstration only. See following page.

Table A-1: Theoretical Compliance Demonstration

Bead Type	Low Pentane				High Pentane	Mid Pentane			
Billet Density	1.00	1.25	1.50	2.00	1.00	1.00	1.25	1.50	2.00
Measured Fresh Bead VOC (Method 306)	3.47%	3.50%	3.50%	3.47%	6.17%	4.42%	4.65%	4.96%	4.30%
Measured Fresh Block VOC (Method 306)	1.58%	1.75%	1.87%	1.64%	2.95%	2.92%	2.89%	2.52%	2.51%
Measured 48-Hour Shed Losses Per 16' Billet (Uncontrolled Storage Emissions)	0.158	0.144	0.225	0.260	0.088	0.269	0.267	0.306	0.286
Measured Starting Billet Wt	205.2	272.1	305.4	396.0	198.0	200.8	242.9	314.0	404.2
lb VOC in Billet	3.24	4.76	5.71	6.49	5.84	5.86	7.02	7.91	10.15
lb Polystyrene in Billet	201.96	267.38	299.69	389.51	192.16	194.94	235.88	306.09	394.05
Percent Polystyrene in Bead Minus Water (lb PS/lb Bead)	96.53%	96.50%	96.50%	96.53%	93.83%	95.58%	95.36%	95.04%	95.70%
lb Raw Bead to Make Billet Minus Water	209	277	311	404	205	204	247	322	412
Uncontrolled Mfg VOC Emissions (lb VOC at raw bead content)	3.95	4.85	5.06	7.38	6.59	3.06	4.34	7.86	7.37
Mfg Emissions If Controlled at 85.5% Overall (lb VOC/lb Raw Bead to Make Billet)	0.57	0.70	0.73	1.07	0.96	0.44	0.63	1.14	1.07
Actual Mfg Emissions Controlled at 93% Overall (lb VOC/lb Raw Bead to Make Billet)	0.277	0.339	0.354	0.517	0.462	0.214	0.304	0.550	0.516
Storage Emissions if Controlled at 85.5% Overall (lb VOC/Billet)	0.023	0.021	0.033	0.038	0.013	0.039	0.039	0.044	0.041
Allowable Emissions (85.5% Controlled Mfg + 85.5% Controlled Storage) lb VOC/Overall Process	0.60	0.72	0.77	1.11	0.97	0.4826	0.67	1.18	1.11
Actual Overall Emissions (93% Controlled Mfg + Uncontrolled Storage) lb VOC/Overall Process	0.43	0.48	0.58	0.78	0.55	0.4828	0.57	0.86	0.80
% Under Rule 1175 (c)(4)	-27.1%	-33.2%	-24.5%	-29.9%	-43.3%	0.1%	-14.6%	-27.7%	-27.8%